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# Complex Formation of Cobalt(II), Nickel(II), and Copper(II) with Adenosine 5′-Triphosphate in Aqueous Solutions

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## Abstract

The compositions and stability constants of Co(II), Ni(II), and Cu(II) complexes with adenosine 5′-triphosphate (ATP) over a wide range of the acidity of the medium and concentrations of ligand, metal, and supporting electrolyte were determined using nuclear magnetic relaxation of water protons together with spectrophotometry and 1H and 31P NMR spectroscopy. Possible structures of the complexes were discussed. Stacking interaction between HATP3-, NaATP3-, and ATP4- was found in the bis-complexes. In alkaline midium, the ligands are linked with deprotonation of the alcohol groups of the ribose ring to give ATPH6- -2. The results give a greater insight into the mechanisms of transphosphorylation in biological systems.